

We claim:

1    1.    A method comprising:  
2           transmitting a packet on a wireless network;  
3           if transmitting the packet is not successful, then performing the tasks of:  
4                   setting a contention window parameter according to a fast backoff operation,  
5           and  
6                   if transmitting a preceding packet is not successful then increasing a threshold  
7           value;  
8           if transmitting the packet is successful and the current value of the contention window  
9           parameter is less than the threshold value then decreasing the contention window parameter  
10          according to a contention avoidance operation; and  
11          if transmitting the packet is successful and the current value of the contention window  
12          parameter is greater than the threshold value then decreasing the contention window  
13          parameter according to a slow start operation.

1    2.    The method of claim 1, wherein the fast backoff operation comprises increasing the  
2          contention window parameter in an exponential manner.

1    3.    The method of claim 2, wherein the fast backoff operation comprises substantially  
2          doubling the contention window parameter.

1    4.    The method of claim 1 wherein the fast backoff operation comprises setting the  
2          contention window parameter to a predetermined maximum value.

1    5.    The method of claim 1, wherein the contention avoidance operation decreases the  
2          contention window parameter in a substantially linear manner.

1    6.    The method of claim 1, wherein the contention avoidance operation subtracts a  
2          predetermined stepsize value from the contention window parameter.

- 1 7. The method of claim 6, wherein the stepsize value is determined according to the  
2 contention window parameter.
- 1 8. The method of claim 1, wherein the slow start operation decreases the contention  
2 window parameter in a substantially exponential manner.
- 1 9. The method of claim 1, wherein the slow start operation substantially halves the  
2 contention window parameter.
- 1 10. The method of claim 1, further comprising setting the contention window parameter to  
2 a predetermined maximum value prior to transmitting any packets.
- 1 11. A network device comprising:  
2 a processor;  
3 a memory coupled to the processor;  
4 a wireless network interface coupled to the processor;  
5 wherein the processor is operable to cause the network interface to:  
6 transmit a packet on a wireless network,  
7 if the packet is not successfully transmitted, then performing the tasks of:  
8 setting a contention window parameter according to a fast backoff  
9 operation, and  
10 if transmitting a preceding packet is not successful then increasing a  
11 threshold value,  
12 if the packet is successful transmitted and the current value of the contention  
13 window parameter is less than the threshold value then decreasing the contention  
14 window parameter according to a contention avoidance operation, and  
15 if transmitting the packet is successful and the current value of the contention  
16 window parameter is greater than the threshold value then decreasing the contention  
17 window parameter according to a slow start operation.

- 1 12. The network device of claim 11, wherein the fast backoff operation comprises  
2 increasing the contention window parameter in an exponential manner.
- 1 13. The network device of claim 12, wherein the fast backoff operation comprises  
2 substantially doubling the contention window parameter.
- 1 14. The network device of claim 11 wherein the fast backoff operation comprises setting  
2 the contention window parameter to a predetermined maximum value.
- 1 15. The network device of claim 11, wherein the contention avoidance operation  
2 decreases the contention window parameter in a substantially linear manner.
- 1 16. The network device of claim 11, wherein the contention avoidance operation subtracts  
2 a predetermined stepsize value from the contention window parameter.
- 1 17. The network device of claim 14, wherein the stepsize value is determined according to  
2 a the current contention window parameter.
- 1 18. The network device of claim 11, wherein the slow start operation decrease the  
2 contention window parameter in a substantially exponential manner.
- 1 19. The network device of claim 11, wherein the slow start operation substantially halves  
2 the contention window parameter value.
- 1 20. The network device of claim 11, further comprising setting the contention window  
2 parameter to a predetermined maximum value prior to transmitting any packets.
- 1 21. The network device of claim 11, wherein the processor, memory and wireless network  
2 interface are incorporated in a network interface card.

1 22. The network device of claim 11, wherein the processor, memory and wireless network  
2 interface are incorporated in a wireless base station.

1 23. The network device of claim 11, wherein the processor, memory and wireless network  
2 interface are incorporated in a personal digital assistant.

1 24. The network device of claim 11, wherein the processor, memory and wireless network  
2 interface are incorporated in a personal computer.

1 25. The network device of claim 11, wherein the processor, memory and wireless network  
2 interface are incorporated in a server computer.

1 26. The network device of claim 11, wherein the wireless network interface is an interface  
2 to network conforming to an IEEE 802.11 protocol.

1 27. A machine readable medium have machine executable instructions for performing a  
2 method for controlling contention in a wireless network device, the method comprising:  
3 transmitting a packet on a wireless network;  
4 if transmitting the packet is not successful, then performing the tasks of:  
5 setting a contention window parameter according to a fast backoff operation,  
6 and  
7 if transmitting a preceding packet is not successful then increasing a threshold  
8 value;  
9 if transmitting the packet is successful and the current value of the contention window  
10 parameter is less than the threshold value then decreasing the contention window parameter  
11 according to a contention avoidance operation; and  
12 if transmitting the packet is successful and the current value of the contention window  
13 parameter is greater than the threshold value then decreasing the contention window  
14 parameter according to a slow start operation.

1 28. The machine readable medium of claim 27, wherein the fast backoff operation  
2 comprises increasing the contention window parameter in an exponential manner.

1 29. The machine readable medium of claim 28, wherein the fast backoff operation  
2 comprises substantially doubling the contention window parameter.

1 30. The machine readable medium of claim 27 wherein the fast backoff operation  
2 comprises setting the contention window parameter to a predetermined maximum value.

1 31. The machine readable medium of claim 27, wherein the contention avoidance  
2 operation decreases the contention window parameter in a substantially linear manner.

1 32. The machine readable medium of claim 27, wherein the contention avoidance  
2 operation subtracts a predetermined stepsize value from the contention window parameter.

1 33. The machine readable medium of claim 32, wherein the stepsize value is determined  
2 according to the contention window parameter.

1 34. The machine readable medium of claim 27, wherein the slow start operation decreases  
2 the contention window parameter in a substantially exponential manner.

1 35. The machine readable medium of claim 27, wherein the slow start operation  
2 substantially halves the contention window parameter.

1 36. The machine readable medium of claim 27, further comprising setting the contention  
2 window parameter to a predetermined maximum value prior to transmitting any packets.

1 37. A system comprising:  
2 a media access and control module;  
3 a distributed coordination function module coupled to the media access and control  
4 module operable to:  
5 transmit a packet on a wireless network,  
6 if the packet is not successfully transmitted, then performing the tasks of:  
7 setting a contention window parameter according to a fast backoff  
8 operation, and  
9 if transmitting a preceding packet is not successful then increasing a  
10 threshold value,  
11 if the packet is successful transmitted and the current value of the contention  
12 window parameter is less than the threshold value then decreasing the contention  
13 window parameter according to a contention avoidance operation, and  
14 if transmitting the packet is successful and the current value of the contention  
15 window parameter is greater than the threshold value then decreasing the contention  
16 window parameter according to a slow start operation.

1 38. The system of claim 37, wherein the fast backoff operation comprises increasing the  
2 contention window parameter in an exponential manner.

1 39. The system of claim 37, wherein the contention avoidance operation decreases the  
2 contention window parameter in a substantially linear manner.

1 40. The system of claim 37, wherein the slow start operation decrease the contention  
2 window parameter in a substantially exponential manner.